General

Guideline Title

Diagnosis and management of stable chronic obstructive pulmonary disease: a clinical practice guideline update from the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society.

Bibliographic Source(s)

Qaseem A, Wilt TJ, Weinberger SE, Hanania NA, Criner G, van der Molen T, Marciniuk DD, Denberg T, Schunemann H, Wedzicha W, MacDonald R, Shekelle P, American College of Physicians, American College of Chest Physicians, American Thoracic Society, European Respiratory Society. Diagnosis and management of stable chronic obstructive pulmonary disease: a clinical practice guideline update from the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society. Ann Intern Med. 2011 Aug 2;155(3):179-191. [62 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Qaseem A, Snow V, Shekelle P, Sherif K, Wilt TJ, Weinberger S, Owens DK, Clinical Efficacy Assessment Subcommittee of the American College of Physicians. Diagnosis and management of stable chronic obstructive pulmonary disease: a clinical practice guideline from the American College of Physicians. Ann Intern Med 2007 Nov 6;147(9):633-8.

All American College of Physicians (ACP) clinical practice guidelines are considered automatically withdrawn or invalid 5 years after publication, or once an update has been issued.

Recommendations

Major Recommendations

Definitions for the strength of evidence (high, moderate, low, or insufficient evidence to determine net benefits or risks) and strength of recommendations (strong, weak) are defined at the end of the "Major Recommendations" field.

Recommendation 1: *The American College of Physicians (ACP), American College of Chest Physicians (ACCP), American Thoracic Society (ATS), and European Respiratory Society (ERS) recommend that spirometry should be obtained to diagnose airflow obstruction in patients with respiratory symptoms* (Grade: strong recommendation, moderate-quality evidence). *Spirometry should not be used to screen for airflow obstruction in individuals without respiratory symptoms* (Grade: strong recommendation, moderate-quality evidence).

Targeted use of spirometry for diagnosis of airflow obstruction is beneficial for patients with respiratory symptoms, particularly dyspnea. Existing evidence does not support the use of spirometry to screen for airflow obstruction in individuals without respiratory symptoms, including those with current or past exposure to risk factors for chronic obstructive pulmonary disease (COPD). Evidence is insufficient to support the use of inhaled

therapies in asymptomatic individuals who have spirometric evidence of airflow obstruction, regardless of the presence or absence of risk factors for airflow obstruction. There is no difference in the annual rate of forced expiratory volume (FEV_1) decline or prevention of symptoms in these individuals with treatment. No evidence from randomized controlled trials (RCTs) supports treating asymptomatic individuals, with or without risk factors for airflow obstruction, who do not have spirometric evidence of airflow obstruction. In addition, evidence does not show any independent benefit of obtaining and providing spirometry results on success rates in smoking cessation. No study evaluated the use of periodic spirometry after initiation of therapy to monitor ongoing disease status or modify therapy.

Recommendation 2: *For stable COPD patients with respiratory symptoms and FEV_1 between 60% and 80% predicted, ACP, ACCP, ATS, and ERS suggest that treatment with inhaled bronchodilators may be used* (Grade: weak recommendation, low-quality evidence).

There is limited and conflicting evidence of health benefits resulting from initiation of inhaled bronchodilators (anticholinergics or long-acting β-agonists) in symptomatic patients with FEV_1 between 60% and 80% predicted as documented by spirometry. Individual patients may benefit from the therapy and may show improvement in their respiratory symptoms. However, the duration of maintenance therapy and the frequency of reevaluation once a patient is receiving therapy are unknown because evidence is limited. Further research is needed to evaluate the health benefits of inhaled therapies (anticholinergics or long-acting β-agonists) in symptomatic patients with FEV_1 between 60% and 80% predicted.

This recommendation does not address the occasional use of short-acting inhaled bronchodilators for acute symptom relief.

Recommendation 3: *For stable COPD patients with respiratory symptoms and FEV_1 < 60% predicted, ACP, ACCP, ATS, and ERS recommend treatment with inhaled bronchodilators* (Grade: strong recommendation, moderate-quality evidence).

Patients who benefit the most from inhaled bronchodilators (anticholinergics or long-acting β-agonists) seem to be those who have respiratory symptoms and airflow obstruction with an FEV_1 less than 60% predicted. The mean FEV_1 was less than 60% predicted in the majority of the trials that evaluated the management of COPD.

This recommendation does not address the occasional use of short-acting inhaled bronchodilators for acute symptom relief.

Recommendation 4: *ACP, ACCP, ATS, and ERS recommend that clinicians prescribe monotherapy using either long-acting inhaled anticholinergics or long-acting inhaled β-agonists for symptomatic patients with COPD and FEV_1 <60% predicted.* (Grade: strong recommendation, moderate-quality evidence). *Clinicians should base the choice of specific monotherapy on patient preference, cost, and adverse effect profile*.

Monotherapy with a long-acting inhaled β-agonist or a long-acting inhaled anticholinergic is beneficial in reducing exacerbations and improving health-related quality of life. Evidence was inconclusive regarding the effect of inhaled agents (anticholinergics and long-acting β-agonists) on mortality, hospitalizations, and dyspnea. Although data support that inhaled corticosteroids are superior to placebo in reducing exacerbations, concerns about their side effect profile (thrush, potential for bone loss, and moderate to severe easy bruisability) and less biologic rationale, in contrast to the rationale that supports the use of inhaled steroids as anti-inflammatory monotherapy in asthma, led to our recommendation that inhaled corticosteroids are not a preferred monotherapy for patients with stable COPD. Adverse effects related to inhaled long-acting anticholinergics or long-acting β-agonists range from mild (for example, dry mouth) to potentially serious (for example, cardiovascular events). Pooled analyses of results from trials of monotherapy show no statistically significant differences in outcomes among various monotherapies. However, some of the large recent trials have shown that different monotherapies may have a greater effect on certain outcomes. These observed effects need to be confirmed with further comparative effectiveness studies. Clinicians should base selection of treatment from among various monotherapies on individual patient preferences, cost, and adverse effect profile.

Recommendation 5: *ACP, ACCP, ATS, and ERS suggest that clinicians may administer combination inhaled therapies (long-acting inhaled anticholinergics, long-acting inhaled β-agonists, or inhaled corticosteroids) for symptomatic patients with stable COPD and FEV_1 <60% predicted* (Grade: weak recommendation, moderate-quality evidence).

Many symptomatic patients with stable COPD and an FEV_1 less than 60% predicted may benefit from combination therapy, but when to use combination therapy instead of monotherapy has not been clearly established. The long-term benefit of combination therapy compared to monotherapy in 2 recent large clinical trials (Towards a Revolution in COPD Health [TORCH] and Understanding the Potential Long-Term Impacts on Function with Tiotropium [UPLIFT]) was moderate for COPD exacerbations and of borderline statistical significance for mortality, but was not consistently seen in earlier trials. In some studies, combination therapy has been associated with a modest increase in the risk for adverse events, whereas other studies have not found this. Thus, the evidence is insufficient to support a strong recommendation for the broad use of combination therapy, and clinicians will need to weigh the potential benefits and harms of combination therapy on a case-by-case basis. The combination therapy that has been most studied to date is long-acting inhaled β-agonists plus inhaled corticosteroids.

Recommendation 6: *ACP, ACCP, ATS, and ERS recommend that clinicians should prescribe pulmonary rehabilitation for symptomatic patients with an FEV_1 <50% predicted* (Grade: strong recommendation, moderate-quality evidence). *Clinicians may consider pulmonary rehabilitation for symptomatic or exercise-limited patients with an FEV_1 >50% predicted.* (Grade: weak recommendation, moderate-quality evidence).

Evidence supports the use of pulmonary rehabilitation for symptomatic patients who have severe COPD (FEV_1 <50% predicted). This is based on the fact that controlled trials of pulmonary rehabilitation have had a mean FEV_1 of less than 50% predicted. The generalizability of the benefits of pulmonary rehabilitation in patients with less severe airflow obstruction is less clear. Physicians may consider prescribing pulmonary rehabilitation for patients with an FEV_1 greater than 50% predicted if they remain symptomatic or have exercise limitation despite maximal medical therapy.

Recommendation 7: *ACP, ACCP, ATS, and ERS recommend that clinicians should prescribe continuous oxygen therapy in patients with COPD who have severe resting hypoxemia (partial pressure of oxygen in arterial blood [PaO_2] ≤55 mm Hg or saturation of peripheral oxygen [SpO_2] ≤88%)* (Grade: strong recommendation, moderate-quality evidence).

To accurately evaluate oxygen status, the assessment should ideally occur when patients are stable rather than during or immediately after an exacerbation. Use of supplemental oxygen for 15 or more hours daily can help improve survival in patients with COPD who have severe resting hypoxemia (PaO_2 ≤55 mm Hg or SpO_2 ≤88%).

Because pulse oximetry has essentially supplanted arterial blood gases as a measure of oxygenation in nonhospitalized patients, it is reasonable to use oxygen saturation measured by pulse oximetry (SpO_2) as a surrogate for PaO_2. On the basis of the typical relationship between PaO_2 and SpO_2 as defined by the oxyhemoglobin dissociation curve, PaO_2 of 55 mm Hg or less correlates approximately with SpO_2 88% or less.

See the figure in the original guideline document for a chart of the summary of the recommendations and clinical considerations.

Definitions:

The American College of Physicians' Guideline Grading System*		
Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced With Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

*Adopted from the classification developed by the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) workgroup.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Stable chronic obstructive pulmonary disease (COPD)

Note: For the purpose of this guideline, the terms *COPD* and *airflow obstruction* are used, where COPD is defined by both physiologic and clinical criteria and airflow obstruction is defined by spirometric findings alone.

Guideline Category

Diagnosis

Evaluation

Management

Screening

Treatment

Clinical Specialty

Family Practice

Internal Medicine

Pulmonary Medicine

Intended Users

Physicians

Guideline Objective(s)

To update the 2007 American College of Physicians clinical practice guideline on diagnosis and management of stable chronic obstructive pulmonary disease (COPD) and present new evidence on the diagnosis and management of stable COPD

Target Population

Adults with stable chronic obstructive pulmonary disease (COPD)

Interventions and Practices Considered

1. History and physical examination
2. Spirometry
3. Treatment strategies, including:
    - Inhaled bronchodilators
    - Monotherapy with either long-acting inhaled anticholinergics or long-acting β-agonists
    - Combination inhaled therapies with long-acting inhaled anticholinergics, long-acting β-agonists, or inhaled corticosteroids
    - Pulmonary rehabilitation
    - Continuous oxygen therapy

Note: This guideline does not address all components of management of a patient with COPD and is limited to pharmacologic management, pulmonary rehabilitation, and oxygen therapy. It does not cover smoking cessation, surgical options, palliative care, end-of-life care, or nocturnal ventilation.

Major Outcomes Considered

- Exacerbations
- Hospitalizations
- Mortality
- Health-related quality-of-life
- Dyspnea

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The Minnesota Evidence-based Practice Center performed an updated literature search that included studies from MEDLINE published between March 2007 and December 2009 (see the "Availability of Companion Documents" field). Additional background material reviewed by the guideline panel included the 2007 systematic evidence review by Wilt and colleagues and the 2005 Agency for Healthcare Research and Quality–sponsored Minnesota Evidence-based Practice Center evidence report.

The literature search focused on evidence for the value of spirometry for screening or diagnosis of chronic obstructive pulmonary disease (COPD); the efficacy and comparative effectiveness of management strategies, such as inhaled monotherapies (anticholinergics, long-acting β-agonists, or corticosteroids), combination therapies, and pulmonary rehabilitation programs, for patients with COPD. For diagnostic accuracy of the physical examination and spirometry, the authors used an updated systematic review from 2008, because the guideline panel agreed that there is no reason to suspect that diagnostic accuracy of the physical examination or spirometry would have changed since the American College of Physicians (ACP) guideline was published in 2007. In addition, they did not update the search for the utility of supplemental oxygen for patients with COPD who have awake, resting hypoxemia because widespread consensus remains on this issue.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

This guideline rates the evidence and recommendations by using the ACP guideline grading system, which is based on the system developed by the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) workgroup (see the "Rating Scheme for the Strength of the Recommendations" field).

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The guideline panel included representatives from each of the 4 collaborating organizations, and the resulting guideline represents an official and joint clinical practice guideline from those organizations. The guideline panel communicated via conference calls and e-mails. The members reached agreement and resolved any disagreements through facilitated discussion. The final recommendations were approved by unanimous vote.

The key questions and scope of the guideline were developed with input from the joint guideline panel. These questions were:

1. What is the value of the history and physical examination for predicting airflow obstruction?
2. What is the value of spirometry for screening and diagnosis of adults who are asymptomatic and have risk factors for developing airflow obstruction, or who are COPD treatment candidates?
3. What management strategies are effective for treating COPD?
    a. Mono- and combination inhaled therapies (anticholinergics, long-acting β-agonists, or corticosteroids)
    b. Pulmonary rehabilitation programs
    c. Supplemental long-term oxygen therapy (evidence not updated)

Evidence reviews and tables were presented to the guideline panel for review and comments. The guideline panel evaluated the recommendations on the basis of the evidence.

Rating Scheme for the Strength of the Recommendations

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Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

*Adopted from the classification developed by the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) workgroup.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

This guideline was approved by the American College of Physicians (ACP) Board of Regents on 31 July 2010; by the American College of Chest Physicians Board of Regents on 6 April 2011; by the American Thoracic Society Executive Committee on 11 April 2011; and by the European Respiratory Society Scientific Committee on 11 April 2011.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate diagnosis and management of stable chronic obstructive pulmonary disease (COPD)

Potential Harms

Adverse effects of therapy

Qualifying Statements

Qualifying Statements

- Clinical practice guidelines are "guides" only and may not apply to all patients and all clinical situations. Thus, they are not intended to over-ride clinicians' judgment.
- The authors of this article are responsible for its contents, including any clinical or treatment recommendations. No statement in this article should be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Mobile Device Resources

Patient Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011 Aug 2

Guideline Developer(s)

American College of Chest Physicians - Medical Specialty Society

American College of Physicians - Medical Specialty Society

American Thoracic Society - Medical Specialty Society

European Respiratory Society - Professional Association

Source(s) of Funding

American College of Physicians

Guideline Committee

Clinical Guidelines Committee

Composition of Group That Authored the Guideline

Authors: Amir Qaseem, MD, PhD, MHA; Timothy J. Wilt, MD, MPH; Steven E. Weinberger, MD; Nicola A. Hanania, MD, MS; Gerard Criner, MD; Thys van der Molen, PhD; Darcy D. Marciniuk, MD; Tom Denberg, MD, PhD; Holger Schünemann, MD, PhD, MSc; Wisia Wedzicha, PhD; Roderick MacDonald, MS; and Paul Shekelle, MD, PhD

Financial Disclosures/Conflicts of Interest

Any financial and nonfinancial conflicts of interest of the group members were declared, discussed, and resolved. Dr. Wilt: *Grant*: American College of Physicians; *Payment for manuscript preparation*: American College of Physicians. Dr. Hanania: *Consultancy*: GlaxoSmithKline, Boehringer Ingelheim, Novartis, Pfizer, Sunovion, Pearl, Forest; *Grants/grants pending (money to institution)*: GlaxoSmithKline, Boehringer Ingelheim, Novartis, Pfizer, Sunovion; *Payment for lectures including service on speakers bureaus*: GlaxoSmithKline, AstraZeneca, Boehringer Ingelheim, Merck. Dr. Criner: Consultancy: Uptake Medical, PortAero, Pulmonx; *Grants/grants pending (money to institution):* Aeris Therapeutics, Emphysas Medica. Dr. van der Molen: *Consultancy*: MSD, AstraZeneca, GlaxoSmithKline, Nycomed; *Grants/grants pending (money to institution)*: AstraZeneca, GlaxoSmithKline, Novartis; *Payment for lectures including service on speakers bureaus*: AstraZeneca, Nycomed, GlaxoSmithKline, MSD. Dr. Marciniuk: *Board membership*: American College of Chest Physicians, Chest Foundation, Lung Association of Saskatchewan, Canadian COPD Alliance, Canadian Thoracic Society; *Consultancy (no payment received)*: Public Health Agency of Canada, Canadian Agency for Drugs and Technology in Health; Consultancy: Saskatchewan Medical Association; *Consultancy (money to institution)*: AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Saskatchewan Health Quality Council, Novartis, Nycomed, Pfizer; *Employment*: University of Saskatchewan, Saskatoon Health Region; *Grants/grants pending (money to institution)*: Canadian Institute of Health Research, AstraZeneca, GlaxoSmithKline, Lung Association of Saskatchewan, Nycomed, Pfizer, Novartis, Saskatchewan Health Research Foundation, Schering-Plough, Saskatchewan Ministry of Health; *Payment for lectures including service on speakers bureaus*: AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Pfizer, Lung Association of Saskatchewan, Canadian Thoracic Society, American Thoracic Society. Dr. Wedzicha: *Grants/grants pending (money to institution)*: Boehringer Ingelheim; *Board membership*: GlaxoSmithKline, Novartis, Bayer, Pfizer, Medimmune/AstraZeneca, Danone/Nutricia, Nycomed; *Consultancy*: Chiesi; *Consultancy (money to institution)*: Novartis; *Grants/grants pending (money to institution)*: GlaxoSmithKline, Novartis, Chiesi, AstraZeneca, Johnson & Johnson; *Payment for lectures including service on speakers bureaus*: Boehringer Ingelheim, GlaxoSmithKline, Pfizer, Bayer, Nycomed, Chiesi; *Travel/accommodations/meeting expenses unrelated to activities listed*: Boehringer Ingelheim. Dr. Shekelle: *Employment*: Veterans Affairs Medical Center; *Grants/grants pending (money to institution)*: Agency for Healthcare Research and Quality (AHRQ), National Institutes of Health, Veterans Administration; *Royalties*: UpToDate; *Travel/accommodations/meetings expenses unrelated to activities listed*: Travel to meetings sponsored by AHRQ, the Health Foundation, the University of Michigan, VA, Italian regional health authority, and RAND. Disclosures can also be viewed at https://www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M11-0925 .

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Guideline Availability

Electronic copies: Available from the Annals of Internal Medicine Web site .

Print copies: Amir Qaseem, MD, PhD, MHA, Available from the American College of Physicians (ACP), 190 N. Independence Mall West,

Philadelphia PA 19106: email, aqaseem@acponline.org.

Availability of Companion Documents

The following is available:

- Qaseem A, Snow V, Owens DK, Shekelle P. The development of clinical practice guidelines and guidance statements of the American College of Physicians: summary of methods. Ann Intern Med. 2010 Aug 3;153(3):194-199. Electronic copies: Available from the Annals of Internal Medicine Web site .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

The following is also available:

- Video news release. Management of stable chronic obstructive pulmonary disease. Available from the American College of Physicians (ACP) Web site .

A collection of Recommendation Summaries for all current ACP Clinical Guidelines is now available for mobile devices from the ACP Web site .

A continuing medical education (CME) is available from the Annals of Internal Medicine Web site .

Patient Resources

The following is available:

- Summaries for patients. Chronic obstructive pulmonary disease: a clinical practice guideline. Ann Intern Med 2011 Aug 2;155:179-191. Electronic copies: Available from the Annals of Internal Medicine Web site .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

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NGC Status

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